APPEAL BRIEF UNDER 37 C.F.R. § 41.37

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Michael J. Lyden
Examiner: George R. Evanisko

Serial No.: 10/680,008
Group Art Unit: 3762

Filed: October 07, 2003
Docket: 279.376US2

For: METHOD FOR MONITORING END OF LIFE FOR BATTERY

APPEAL BRIEF UNDER 37 CFR § 41.37

Mail Stop Appeal Brief- Patents
Commissioner for Patents
P.O. Box 1450
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Sir:

The Appeal Brief is presented in response to the Notice of Panel Decision from Pre-Appeal Brief Review mailed on April 2, 2008 and further in support of the Notice of Appeal to the Board of Patent Appeals and Interferences, filed on February 21, 2008, from the Final Rejection of claims 9-18 and 21-30 of the above-identified application, as set forth in the Final Office Action mailed on November 28, 2008.

The Commissioner of Patents and Trademarks is hereby authorized to charge Deposit Account No. 19-0743 in the amount of $510.00 which represents the requisite fee set forth in 37 C.F.R. § 41.20(b)(2). The Appellants respectfully request consideration and reversal of the Examiner's rejections of pending claims.

1. REAL PARTY IN INTEREST

The real party in interest of the above-captioned patent application is the assignee, CARDIAC PACEMAKERS, INC..

2. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellant that will have a bearing on the Board's decision in the present appeal.

3. STATUS OF THE CLAIMS

Claims 9-18 and 21-30 are pending.

Claims 1-8 and 19-20 were canceled during prosecution.

Claims 9-18 and 21-30 stand rejected.

Claims 9-18 and 21-30 are being appealed.

4. STATUS OF AMENDMENTS

No amendments have been made subsequent to the Final Office Action dated November 28, 2007.

5. SUMMARY OF CLAIMED SUBJECT MATTER

INDEPENDENT CLAIM 9

Independent claim 9 recites a pacemaker, such as that of FIG. 3A, including a battery power terminal for a pacemaker battery (FIG. 3A, near Ibatt; page 16, line 8), a capacitor (FIG. 3A, C_s), pacemaker control circuitry (FIG. 3A, Sensing & Pace Control Circuitry) and charge time measurement control circuitry (FIG. 3A, CHG-TIME MEAS CONTROL). The pacemaker control circuitry is connected to the battery power terminal and the capacitor, and controls current flow from the battery power terminal to the capacitor to charge the capacitor and to discharge the capacitor to a discharge voltage level (Vd) before beginning a time charge measurement (see FIG.3A, reg_V_d; see, for example, page 28, lines 18-26; page 29, lines 4-7; page 30, lines 1-4). The charge time measurement (CTM) control is adapted to access a predetermined set of charge time measurement set-up parameters (FIG. 3A, CHG-TIME MEAS CONTROL, reg_V_f, reg_V_i, reg_V_d) and a predetermined elective replacement time (ERT) charge time limit associated with an AC impedance target for the battery (see, for example, page 32, lines 6-14). determine a rate of charge storage in the capacitor using the predetermined set of charge time measurement set-up parameters (see, for example, page 8, lines 8-20; page 27, page 31, line 17 to page 32, line 11), and declare an ERT using the determined rate of charge storage in the capacitor and the ERT charge time limit (see, for example, page 32, lines 11-12). The predetermined set of charge time measurement set-up parameters to be accessed by the CTM control circuitry include a final voltage (VF) to end the charge time measurement for determining the rate of charge storage in the capacitor (FIG.3A, reg_V_f; see, for example, page 28, lines 6-8; page 31, Table 2; page 32, lines 9-12) and an initial reference voltage (VI) (FIG.3A, reg_V_i; see, for example, page 31, Table 2) to begin the charge time measurement for determining the rate of charge storage in the capacitor (page 28, lines 10-16), VI being greater than Vd (FIG. 3B; see, for example, page 28, lines 20-26). The capacitor is electrically connected to the battery power terminal. The pacemaker control circuitry is electrically connected to the battery power terminal.

DEPENDENT CLAIM 10

Dependent claim 10 recites a pacemaker, such as that of FIG. 3A, wherein the pacemaker control circuitry (FIG. 3A, CHG-TIME MEAS CONTROL) includes comparison circuitry for comparing a battery terminal voltage (Vbatt) to a brownout voltage limit (Vstop) (FIG. 3A, Vbatt > Vstop / Vstop comparator; see, for example, page 20 lines 11 ff. and FIG. 2; page 24 lines 4 ff.), and for comparing a capacitor voltage (Vcs) to one of the predetermined set of charge time measurement set-up parameters (FIG. 3A, Vx / Vcs comparator; see, for example, page 29 lines 21 to page 30 line 16).

DEPENDENT CLAIM 12

Dependent claim 12 recites a pacemaker, such as that of FIG. 3A,wherein the pacemaker control circuitry (FIG. 3A, CHG-TIME MEAS CONTROL) controls current flow to the capacitor to increase a capacitor voltage (V_{cs}) approximately linearly from VI to VF during the time measurement for determining the rate of charge storage in the capacitor .

DEPENDENT CLAIM 14

Dependent claim 12 recites a pacemaker, such as that of FIG. 3A, wherein the CTM control circuitry (FIG. 3A, CHG-TIME MEAS CONTROL) includes a time charge counter (FIG. 3A, TCHG COUNTER; see, for example, page 30 lines 10-16)) for measuring a time in which a relatively constant current charges the capacitor from VI to VF (FIGS. 3B and 3C; see, for example, page 16 lines 2 ff. and FIG. 2).

DEPENDENT CLAIM 27

Dependent claim 27 recites a pacemaker, such as that of FIG. 3A, wherein the CTM control circuitry (FIG. 3A, CHG-TIME MEAS CONTROL) includes a memory (FIG. 3A, reg_V_F, reg_V_I, reg_V_d) and means for loading the memory with a pacing voltage amplitude value to function as the charged voltage reference (VF), an initial value to function as the initial voltage reference (VI), and a discharge value to function as the discharged voltage reference (Vd) (a means plus function permitted by 35 U.S.C. 112, sixth paragraph; see FIG. 3A, CHG-TIME MEAS CONTROL; page 28 line1 to page 29 line 23).

INDEPENDENT CLAIM 21

In dependent claim 21 recites a system including a battery power terminal for a battery (FIG. 3A, near Ibatt; page 16, line 8), a capacitor (FIG. 3A, C_s), means to control current flow from the battery power terminal to charge the capacitor (FIG. 3A, SENSING AND PACE CONTROL CIRCUITRY, CHG-TIME MEAS CONTROL, SWITCHED CAPACITOR POWER SUPPLY; page 22, lines 28-29; page 23, line 10-15, lines 23-25), means to access a predetermined set of charge time measurement set-up parameters (FIG. 3A, CHG-TIME MEAS CONTROL, reg_V_f, reg_V_i, reg_V_d, D/A registers; page 28, lines 1-3) and a predetermined elective replacement time (ERT) charge time limit associated with an AC impedance target for the battery (page 32, lines 6-14). The predetermined set of charge time measurement set-up parameters to be accessed by the CTM control circuitry include a final voltage (VF) to end the charge time measurement for determining the rate of charge storage in the capacitor (FIG.3A, reg_V_f; page 28, lines 6-8; page 31, Table 2; page 32, lines 9-12), an initial reference voltage (VI) (FIG.3A, reg_V_i; page 31, Table 2) to begin the charge time measurement for determining the rate of charge storage in the capacitor (page 28, lines 10-16), and a discharge voltage reference (Vd) (FIG.3A, reg_V_d; page 31, Table 2) to which the capacitor is discharged prior to beginning the time measurement (FIG. 3B, Vdischarge; page 30, lines 1-4) for determining the rate of charge storage in the capacitor, Vd being less than VI (see FIG. 3B; page 28, lines 20-21). The system includes means to determine a rate of charge storage in the capacitor using the predetermined set of charge time measurement set-up parameters (FIG. 3A, CHG-TIME MEAS CONTROL, reg_V_f, reg_V_i, reg_V_d ,page 8, lines 8-20; page 27; page 31, line 17 to page 32, line 11), means to compare the determined rate of charge storage in the capacitor to the predetermined ERT charge time limit for the predetermined set of charge time measurement set-up parameters (FIG. 3A, CHG-TIME MEAS CONTROL, page 32, lines 11-12), and means to declare an ERT based on a number of comparisons between the determined rate of charge storage in the capacitor and the ERT charge time limit (FIG. 3A, CHG-TIME MEAS CONTROL, page 32, lines 12 ff).

This summary does not provide an exhaustive or exclusive view of the present subject matter, and Appellant refers to each of the appended claims and its legal equivalents for a complete statement of the invention.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

§102 and §103 Rejections of the Claims

Whether claim 9-11, 14, 18, 21, 28 and 30 were was properly rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative under 35 U.S.C. § 103(a) as obvious over Kroll (U.S. Patent No. 5,741,307).

§103 Rejection of the Claims

Whether claims 12 and 24-27 were properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Kroll (U.S. Patent No. 5,741,307) as applied to claims 9 and 21 above.

Double Patenting Rejection

Appellant acknowledged the double patenting rejection of claim 9-18 and 21-30.

Claims 13, 15-17, 22-23 and 29 are not rejected under §102 or §103, and thus would appear to be in condition for allowance upon submission of a proper Terminal Disclaimer. As indicated during prosecution, Appellant will address the double patenting rejection when there are no other outstanding rejections to the pending claims.

7. ARGUMENT

A) The Applicable Law

A)(1) Under 35 U.S.C. §102(e)

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *MPEP §2131, citing Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). To anticipate a claim, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter. *PPG Industries, Inc. V. Guardian Industries Corp.*, 75 F.3d 1558, 37 USPQ2d 1618 (Fed. Cir. 1996). The identical invention must be shown in as complete detail as is contained in the ... claim. *MPEP §2131, citing Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, i.e., identity of terminology is not required. *MPEP §2131*, citing *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. *MPEP §2123, citing Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), *cert. denied,* 493 U.S. 975 (1989).

"To serve as an anticipating when the reference is silent about the asserted inherent characteristic, such gap in the reference may be filled with recourse to extrinsic evidence. Such evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991). "This modest flexibility in the rule that 'anticipation' requires that every element of the claims appear in a single reference accommodates situations where the common knowledge of technologists is not recorded in the reference; that is, where technological facts are known to those in the field of the invention, albeit not known to judges." *Id.* at 1269. "[The inherent disclosure] must be necessarily present **and** a person of ordinary skill in the art would recognize its presence."(emphasis added) *Crown Operations Intl. v. Solutia, Inc.*, 289 F.3d 1367, 1377 (Fed. Cir. 2002). An assertion of inherency can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

In order to be anticipating, a prior art reference must be enabling so that the claimed subject matter may be made or used by one skilled in the art. *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1354 (Fed. Cir. 2003); *Helifix, Ltd. v. Blok-Lok, Ltd.*, 208 F.3d 1339, 1346 (Fed. Cir. 2000); *Akzo N.V. v. U.S. Int'l Trade Comm'n*, 808 F.2d 1471, 1479 (Fed. Cir. 1986). Prior art is not enabling so as to be anticipating if it does not enable a person of ordinary skill in the art to carry out the invention. See *Elan Pharms., Inc. v. Mayo Found.*, 346 F.3d 1051, 1057 (Fed. Cir. 2003).

A)(2) Under 35 U.S.C. §103(a)

The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art. *Graham v. John Deere Co.,* 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966). *See also KSR Int'l Co. v. Teleflex Inc.*,, 127 S.Ct 1727, 1734, 82 USPQ2d 1385, 1391 (2007) (While the sequence of these questions might be reordered in any particular case, the *[Graham]* factors continue to define the inquiry that controls).

The Supreme Court stated "[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *Id.* at 1740-41, 82 USPQ2d at 1396. The Court noted that "[t]o facilitate review, this analysis should be made explicit. *Id.* (citing *In re Kahn,* 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006)). ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness."). *Id* at 1741, 82 USPQ2d at 1396.

"All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." *MPEP*

2144.03 states, with respect to rejections taking official notice of facts not in the record, "such rejections should be judiciously applied." Section A of this MPEP section states: "It would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known." Section B of this MPEP section indicates that, if official notice is taken of a fact, unsupported by documentary evidence, the technical line of reasoning underlying a decision to take such notice must be clear and unmistakable.

According to MPEP 706.02(j), the following should be set forth in a §103 rejection: (A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate; (B) the difference or differences in the claim over the applied reference(s); (C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter; and (D) an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification. Additionally, this section states that it is important for an examiner to properly communicate the basis for a rejection so that the issues can be identified early and the applicant can be given fair opportunity to reply.

B) Discussion of the rejection of claims 9-11, 14, 18, 21, 28 and 30 under 35 U.S.C. § 102(e) as anticipated by or, in the alternative under 35 U.S.C. § 103(a) as obvious over Kroll (U.S. Patent No. 5,741,307).

This rejection was timely traversed. Appellant asserts that (1) the Office mischaracterizes Kroll to make improper conclusions and (2) the Office has not established a *prima facie* case of inherency.

A discharge voltage and an initial voltage for a time measurement are distinguished in the claims. For example, claim 9 recites, among other things, that VI is greater than Vd and claim 21 recites, among other things that Vd is less than VI.

As identified in Appellant's specification, the charge transfer from the battery bypass capacitor C_b to the pacing supply capacitor C_S may be problematic for the charge time measurement near the end of life when the battery impedance is high, and thus an initial voltage for a time measurement is higher than a discharge voltage (e.g. page 15, lines 26+; page 25, lines 27-28; page 27, lines 4-7; page 28 lines 10-26; FIGS. 3A-3C).

B(1) Kroll (U.S. Patent No. 5,741,307)

Kroll refers to a method for determining a replacement time for a battery of an implantable cardioverter defibrillator (ICD) (e.g. Title, col. 1 line 24; col. 3 line 50 ff. col. 7 line 48 ff. col. 8 line 48 ff.). Kroll uses terminal battery voltage as one indicator of battery strength, and uses capacitor charge time during a capacitor reformation process as another indicator (col. 3 lines 26-49). Battery terminal voltage measurements are taken every 12, 24 or 48 hours (col. 8 lines 62 ff.) and capacitor reformation is scheduled once every 30 to 70 days (col. 9 line 10 ff.). There is no enabling disclosure that the capacitor is charged from a discharge voltage to an initial voltage (higher than the discharge voltage) for a charge time measurement, and then beginning the charge time measurement from the initial voltage. There is no reasoning provided with a rational underpinning why one would modify Kroll to charge the capacitor from a discharge voltage to an initial voltage (higher than the discharge voltage) for a charge time measurement, and then begin the charge time measurement from the initial voltage.

B)(2) The ICD of Kroll does not anticipate the pacemaker claimed in claim 9.

Claim 9 recites, among other things, a pacemaker, including pacemaker control circuitry. An ICD is different than a pacemaker. As identified in Applicant's specification, a problem with pacemakers is that the electronics of the system is not able to be shut down to perform the measurements (e.g. page 6 lines 3-10; page 10 line 22 to page 11 line 21), and charge transfer from the battery bypass capacitor C_b to the pacing supply capacitor C_S may be problematic for the charge time measurement near the end of life when the battery impedance is high (e.g. page 15, lines 26+; page 25, lines 27-28; page 27, lines 4-7; page 28 lines 10-26; FIGS. 3A-3C).

B)(3) Kroll does not distinguish between a discharge voltage and an initial voltage for a time measurement.

Appellant respectfully asserts that Kroll begins its time measurement at the discharge voltage (either the fully discharged capacitor voltage or the partially discharged capacitor voltage/ "residual capacitor voltage") (col. 7 line 60 ff.). Thus, Kroll does not distinguish between a discharge voltage and an initial voltage for a time measurement. Appellant has not found, and the Office has not shown that Kroll begins to charge the capacitor from the discharge voltage (regardless of whether it is fully discharged or partially discharged) before beginning the time measurement at an initial voltage that is higher than the discharge voltage.

B)(4) The Office improperly assumes that, because Kroll discharges a capacitor (to a discharge voltage), the discharge voltage must be less than an initial reference voltage (VI) for a charge time measurement.

Claims 9 and 21 recite a discharge voltage level (Vd), and recite charge time measurement set-up parameters that include a final voltage (VF) and an initial reference voltage (VI). Both claims 9 and 21 indicate that the capacitor is discharged to the discharge voltage (Vd) before beginning a time charge measurement, that the time charge measurement begins at the initial reference voltage (VI), that VI is greater than Vd, and that the charge time measurement ends at the final voltage (VF).

The Office asserts that "Kroll's system will have VI being greater than VD since the capacitor will be completely discharged, therefore having VD at 0 volts, and since VI will be the initial voltage applied to the capacitor to start charging the capacitor, which will be above 0 volts." However, the Office has not provided any objective evidence to support its conclusion that Kroll's time measurement begins at a voltage "above 0 volts" if the capacitor is fully discharged. Appellant respectfully submits that VI and VD are the same in Kroll.

B)(5) Discharging a capacitor before a charge time measurement does not mean that the capacitor is charged from a discharge voltage to an initial reference voltage (VI) higher than the discharge voltage before beginning the charge time measurement.

Kroll indicates that an "embodiment must include the complete discharge of the full charged capacitor prior to or contemporaneously with measurement/determination of the charging time, or use a corrected charge time based on a residual capacitor voltage found before the initiation of a new charge cycle (col. 8 lines 7-12). This does not refer to an initial reference voltage (VI) higher than the discharge voltage. Rather, by distinguishing fully discharged from partially discharged ("residual capacitor voltage") and the need to use a "corrected charge time' for partially discharged capacitors that leave a residual voltage, this section indicates that the charge time measurement begins at the discharge voltage of the capacitor, regardless of whether the discharge voltage is of a fully discharged or partially discharged capacitor.

B)(6) The Office improperly asserts that "it is inherent that the system have programmable VI and VF set up parameter since the system must be programmed to know at what voltage to start charging the capacitor and at what voltage to end the charging of capacitor.

It is not necessary for Kroll to have programmable initial voltage (VI) and programmable final voltage (VF) set up parameters. Kroll indicates that "it is important that the reformation process include the complete discharge of the fully charged capacitor and its subsequent full recharge" (col. 7 lines 61-64). If the discharge voltage is the same as the initial voltage, and if it is "important," as provided by Kroll, that the capacitor be fully discharged and fully charged, then the initial voltage and final voltage are determined by the fully-discharged and fully-charged capacitor. These are not voltages that need to be programmed. Thus, it is not inherent that Kroll includes these programmable parameters.

B)(7) The Office improperly asserts that Kroll includes an A/D converter for use in making comparisons of the battery voltage to an ERT voltage (the claimed "brown out voltage").

The ERT voltage is not the same as the claimed brown out voltage. Also, the A/D converter digitizes a VCAP voltage and a VBATT voltage (col. 6 line 10 ff.).

B)(8) The Office does not even assert that Kroll has constant current or increases a capacitor voltage approximately linearly from VI to VF for determining the rate of charge storage.

Constant current is discussed, for example, page 20 lines 11 ff. and FIG. 2; page 24 lines 4 ff.) of Appellant's specification.

B)(9) Kroll does not anticipate claims 9-11, 14, 18, 21, 28 and 30 under §102.

Independent Claim 9

Kroll does not anticipate a pacemaker, that includes pacemaker control circuitry electrically connected to the battery power terminal and the capacitor for controlling current flow from the battery power terminal to the capacitor to charge the capacitor and to discharge the capacitor to a discharge voltage level (Vd) before beginning a time charge measurement, and recited in claim 9. Kroll does not anticipate charge time measurement (CTM) control circuitry access a predetermined set of charge time measurement set-up parameters and a predetermined elective replacement time (ERT) charge time limit associated with an AC impedance target for the battery, determine a rate of charge storage in the capacitor using the predetermined set of charge time measurement set-up parameters; and declare an ERT using the determined rate of charge storage in the capacitor and the ERT charge time limit, as recited in claim 9. Kroll does not anticipate charge time measurement set-up parameters including a final voltage (VF) to end the charge time measurement for determining the rate of charge storage in the capacitor, and an initial reference voltage (VI) to begin the charge time measurement for determining the rate of charge storage in the capacitor, where VI is greater than Vd, as recited in the claim.

Dependent Claim 12

Kroll does not anticipate a pacemaker, that includes pacemaker control circuitry to control current flow to the capacitor to increase a capacitor voltage (V_{cs}) approximately linearly from VI to VF during the time measurement for determining the rate of charge storage, as recited in claim 12.

Dependent Claim 14

Kroll does not anticipate a pacemaker, that includes CTM control circuitry includes a time charge counter for measuring a time in which a relatively constant current charges the capacitor from VI to VF, as recited in claim 14.

Independent Claim 21

Kroll does not anticipate a system, comprising means to access a predetermined set of charge time measurement set-up parameters and a predetermined elective replacement time (ERT) charge time limit associated with an AC impedance target for the battery where the charge time measurement set-up parameters include a charged voltage reference (VF) to end a charge time measurement for determining the rate of charge storage in the capacitor, an initial voltage reference (VI) to begin the charge time measurement for determining the rate of charge storage in the capacitor, and a discharge voltage reference (Vd) to which the capacitor is discharged prior to beginning the time measurement for determining the rate of charge storage in the capacitor, where Vd is less than VI, as recited in the claim. Kroll does not anticipate a system, comprising means to determine a rate of charge storage in the capacitor using these charge time measurement set-up parameters, or means to compare the determined rate of charge storage in the capacitor to the predetermined ERT charge time limit for the predetermined set of charge time measurement set-up parameters, and means for means to declare an ERT based on a number of comparisons between the determined rate of charge storage in the capacitor and the ERT charge time limit.

B)(10) The Office has not established a prima facie case of obviousness to reject claims 9-11, 14, 18, 21, 28 and 30 under §103 using Kroll.

The Office Action states: *In the alternative, Kroll discloses the claimed invention except for the charge time set up parameters, such as VI and VF, and the use of a separate pacemaker control circuit and CTM control circuit. It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate in the charging system and method as taught by Kroll, the charge time set up parameters, such as VI and VF, since it was well known in the art that charging system and methods use charge time set up parameters, such as VI and VF, so that the system knows at what voltage to start the charging the capacitor and at what voltage to sot the charging the of the capacitor so the capacitor can be charged to be tested / used.*

The §103 rejections amount to cursory conclusions without a clearly articulated reasoning with a rationale underpinning required to support a legal conclusion of obviousness. These conclusions doe not even address the specific language of the claims addressed by Appellant in sections B(3)-(9) of this appeal brief.

C) Discussion of the rejection of claims 12 and 24-27 under 35 U.S.C. § 103(a) as obvious over Kroll (U.S. Patent No. 5,741,307).

This rejection was timely traversed. Claims 12 and 27 depend on independent claim 9, and claims 24-26 depend, either directly or indirectly, on independent claim 21. These dependent claims are asserted to be in condition for allowance at least for the reasons provided with respect to their independent claims. This §103 rejection amounts to cursory conclusions without a clearly articulated reasoning with a rationale underpinning required to support a legal conclusion of obviousness. Thus, it is improper.

SUMMARY

The pending claims subject to this appeal are believed patentable. Appellant respectfully submits the claims are in condition for allowance and requests the Board issue an order to withdraw the rejections of claims 9-12, 14, 18, 21, 24-28 and 30 using Kroll.

The double patenting rejection will be addressed when all pending claims are otherwise found to be in condition for allowance.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 1 day of May 2008.

NATE GANNON
Name

Signature

8. CLAIMS APPENDIX

9. A pacemaker, including:

a battery power terminal for a pacemaker battery;

a capacitor electrically connected to the battery power terminal;

pacemaker control circuitry electrically connected to the battery power terminal and the capacitor for controlling current flow from the battery power terminal to the capacitor to charge the capacitor and to discharge the capacitor to a discharge voltage level (Vd) before beginning a time charge measurement; and

charge time measurement (CTM) control circuitry electrically connected to the pacemaker control circuitry and adapted to:

access a predetermined set of charge time measurement set-up parameters and a predetermined elective replacement time (ERT) charge time limit associated with an AC impedance target for the battery;

determine a rate of charge storage in the capacitor using the predetermined set of charge time measurement set-up parameters; and

declare an ERT using the determined rate of charge storage in the capacitor and the ERT charge time limit,

wherein the predetermined set of charge time measurement set-up parameters to be accessed by the CTM control circuitry include:

a final voltage (VF) to end the charge time measurement for determining the rate of charge storage in the capacitor; and

an initial reference voltage (VI) to begin the charge time measurement for determining the rate of charge storage in the capacitor, VI being greater than Vd.

10. The pacemaker of claim 9, wherein the pacemaker control circuitry includes comparison circuitry for comparing a battery terminal voltage (Vbatt) to a brownout voltage limit (Vstop),

and for comparing a capacitor voltage (Vcs) to one of the predetermined set of charge time measurement set-up parameters.

11. The pacemaker of claim 10, wherein the pacemaker control circuitry further includes a switched capacitor power supply operably connected to the battery power terminal and the capacitor for charging the capacitor, wherein an output of the comparison circuitry is electrically connected to the switched capacitor power supply to control current flow from the battery power terminal to the capacitor.

12. The pacemaker of claim 9, wherein the pacemaker control circuitry controls current flow to the capacitor to increase a capacitor voltage (V_{cs}) approximately linearly from VI to VF during the time measurement for determining the rate of charge storage in the capacitor.

13. The pacemaker of claim 9, wherein:

the CTM control circuitry includes a multiplexer for selecting one of VF and VI to be compared to a capacitor voltage level (V_{CS}) within the pacemaker control circuitry; and

the CTM control circuitry is adapted to select VI to be compared to Vsc to begin a time charge measurement and VF to be compared to V_{CS} to end the time charge measurement.

14. The pacemaker of claim 9, wherein the CTM control circuitry includes a time charge counter for measuring a time in which a relatively constant current charges the capacitor from VI to VF.

15. The pacemaker of claim 9, wherein the pacemaker control circuitry includes a sensing and pacing control block adapted for selecting VI.

16. The pacemaker of claim 9, wherein the CTM control circuitry includes a multiplexer for selecting one of the VF, VI and Vd to be compared to a capacitor voltage level (V_{CS}).

17. The pacemaker of claim 16, further comprising:

a capacitor discharge switch;

a bypass capacitor connected across the battery power terminal; and

means to provide a brown out voltage limit;

wherein the CTM control circuitry is adapted to compare:

Vd to V_{CS} to limit the discharge of the capacitor and open the capacitor discharge switch;

VI to V_{CS} to begin a time charge measurement after the bypass capacitor (Cb) is discharged and a battery terminal voltage (Vbatt) is driven to the brownout voltage (Vstop) limit; and

VF to V_{CS} to end the time charge measurement.

18. The pacemaker of claim 9, wherein the VF is programmable by a physician.

19–20. (Canceled)

21. A system, comprising:

a battery power terminal for a battery;

a capacitor electrically connected to the battery power terminal;

means to control current flow from the battery power terminal to charge the capacitor;

means to access a predetermined set of charge time measurement set-up parameters and a predetermined elective replacement time (ERT) charge time limit associated with an AC impedance target for the battery, the predetermined set of charge time measurement set-up parameters including:

a charged voltage reference (VF) to end a charge time measurement for determining the rate of charge storage in the capacitor;

an initial voltage reference (VI) to begin the charge time measurement for determining the rate of charge storage in the capacitor; and a discharge voltage reference (Vd) to which the capacitor is discharged prior to beginning the time measurement for determining the rate of charge storage in the capacitor, Vd being less than VI;

means to determine a rate of charge storage in the capacitor using the predetermined set of charge time measurement set-up parameters;

means to compare the determined rate of charge storage in the capacitor to the predetermined ERT charge time limit for the predetermined set of charge time measurement set-up parameters; and

means to declare an ERT based on a number of comparisons between the determined rate of charge storage in the capacitor and the ERT charge time limit.

22. The system of claim 21, wherein further comprising:

means to calculate an AC impedance of the battery using the determined rate of charge storage and the predetermined set of charge time measurement set-up parameters; and

means to determine the ERT charge time limit using the AC impedance of the battery.

23. The system of claim 21, further comprising:

a table containing relationships between a number of AC impedances for the battery and a number of rates of charge storage;

means to perform a table look-up using the table and the determined rate of charge storage to determine the AC impedance of the battery; and

means to determine the ERT charge time limit using the AC impedances.

24. The system of claim 21, further comprising means to display charge remaining in the battery.

25. The system of claim 24, wherein the programmer circuitry includes means to graphically display the charge remaining in the battery.

26. The system of claim 21, further comprising means to estimate a time until the ERT is declared.

27. The pacemaker of claim 9, wherein the CTM control circuitry includes:

a memory; and

means for loading the memory with a pacing voltage amplitude value to function as the charged voltage reference (VF), an initial value to function as the initial voltage reference (VI), and a discharge value to function as the discharged voltage reference (Vd).

28. The pacemaker of claim 9, wherein the pacemaker battery is a lithium battery.

29. The system of claim 21, wherein the means to determine a rate of charge storage in the capacitor includes:

means to compare a voltage across the storage capacitor (V_{CS}) to the discharge voltage reference while discharging the storage capacitor to the discharge voltage reference;

means to compare V_{CS} to the initial voltage reference while charging the storage capacitor, and to initiate the measuring of the charge time for the storage capacitor when V_{CS} reaches the initial voltage reference; and

means to compare V_{CS} to the charged voltage reference while charging the storage capacitor to the charged voltage reference, and ending the measuring of the charge time for the storage capacitor when V_{CS} reaches the charged voltage reference.

30. The system of claim 21, wherein the battery is a lithium battery.

9. EVIDENCE APPENDIX

None.

10. RELATED PROCEEDINGS APPENDIX

None.